THYROID DETECTION AND CLASSIFICATION USING DNN BASED ON HYBRID META-HEURISTIC AND LSTM TECHNIQUE

Description:

1. In this project based on Streamlit Webpage model.
2. Input: The **Thyroid image dataset** are implemented as input. The input image are taken in the format .jpg or .png
    - DDTI dataset image of ultrasound
3. Pre-processing: The collected images are subjected to pre-processing. In the Preprocessing step we can implement the Image Resize are performed.
    - **Image Resize**
    - **Noise filter**
    - **Gray Scale Conversion**
4. **Data Augmentation** : In this step, we can extract the feature from the pre-processed image by using Data Augmentation Method
5. **Segmentation**: In this step using **algorithm** edge detection to identify the Thyroid tumor areas and percentage .
    - Hybrid Segmentation Image Technique Utilizing Optimized Otsu's Approach
6. Feature Extraction : It is based on Thyroid Image Feature Selection Using Hybrid meta-Heuristic Algorithm **(BWO-MFO) Algorithm**
7. **Image splitting:** In this step, the pre-processed data's are split into train set and test set for decision
    - **Train data** is used for evaluate the model (80%).
    - **Test data** is used for predict the model (20%).

8. **Classification:** In this step, we can implement the Deep learning algorithms classification model such as,
    - **VGG16 and 19 Algorithm**
    - **Densenet 121 Algorithm**
    - **Hybrid LSTM and (VGG19) CNN Algorithm**
    - **Proposed : Hybrid Densenet 121 and Mobilenet V3 Algorithm**
9. **Output: Finally,**
    - Predict or classify the input image is Thyroid disease or not disease by using classification algorithm and which type of Thyroid disease.
10. **Performance Estimation:** In this step, we can analyse some performance metrics such as,
    - Accuracy
    - SSIM
    - PSNR
    - Classification Report
    - Confusion Metrics
    - Error Rate
    - Training and testing Plot
    - ROC Curve
11. **Web page:** In this step, we can implement the project in web page model.
    - Image Upload: Once logged in, users can upload an image of the Thyroid sample.
    - Prediction Results: After uploading the image, the system will process the image and display the prediction results, including the detected Thyroid tumour (classification and type).